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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/656,481

09/04/2003

Yosuke Fujii

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EXAMINER

HODGE, ROBERT W

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

06/09/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/656,481	<b>Applicant(s)</b> FUJII ET AL.	
	<b>Examiner</b> ROBERT HODGE	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 April 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/4/08 has been entered.

### ***Response to Arguments***

Applicant's arguments, see Remarks, filed 4/4/08, with respect to the rejection of claims 1-4 and 6 under 35 U.S.C. 112, first paragraph have been fully considered and are persuasive. The rejection of claims 1-4 and 6 under 35 U.S.C. 112, first paragraph has been withdrawn.

Applicant's arguments, see Remarks, filed 4/4/08, with respect to the rejection(s) of claim(s) 1-4 and 6 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. Pre-Grant Publication No. 2003/0003342.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 2 and 6 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. Pre-Grant Publication No. 2003/0003342 hereinafter Sugita in view of U.S. Patent No. 5,464,700 hereinafter Steck.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention “by another”; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

It should also be noted that U.S. 2003/0003342 currently qualifies as prior art under 35 U.S.C. 102(a).

As seen in figure 6 which would be placed in a completed cell such as in figure 3, Sugita teaches a fuel cell comprising an electrolyte electrode assembly 90 (EEA), including a pair of electrodes 34 and 36 that sandwich an electrolyte 32, the electrodes include gas diffusion layers, first and second separators 52 and 54 that sandwich the EEA each having respective reactant gas flow fields 60 and 62 for supplying reactants to said electrodes, a seal member 92 having a main seal with an outer boundary wholly interposed between and contacting said first separator and said electrolyte and an inner portion interposed between and contacting the first separator and a planar portion or the other gas diffusion layer, wherein said inner portion of the seal member includes a flow field wall defining one portion of power generation areas of said electrodes, wherein a side of said flow field wall, said outer region of said other gas diffusion layer and said first metal separator define an outermost one of said reactant gas flow fields. Sugita further teaches in figure 3 that the first separator includes a surface in contact with said electrode and a flat surface spaced from said electrode, said seal member further includes a main seal interposed between said electrolyte and said flat surface and said flow field wall is interposed between said outer region of said other gas diffusion layer and said flat surface. See paragraphs [0042]-[0048].

Sugita does not teach that a surface area of one of the gas diffusion layers is larger than the surface area of the other gas diffusion layer or that the separators are metal.

As seen in figure 6, Steck teaches a fuel cell comprising an electrolyte electrode assembly (EEA) 40 including a pair of electrodes 18 and 20 with an electrolyte 16

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interposed between said electrodes, said electrodes include gas diffusion layers (i.e. carbon fiber electrodes) with respective electrode catalyst layers facing said electrolyte (i.e. electrochemically active portion), wherein a surface area of the electrode (i.e. gas diffusion layer (GDL)) 20 is larger than the surface area of the electrode (i.e. GDL) 18 and electrode (i.e. GDL) 20 includes an outer marginal region extending outwardly beyond an outer region of electrode (i.e. GDL) 18, two electrically conductive separators 22 and 24 sandwich the EEA with respective reactant gas flow fields, a seal member 12 having an outer portion (around 18b) interposed between and contacting the separator 22 and the electrolyte 16 and an inner portion 12c interposed between and contacting the separator 22 and the electrode (i.e. GDL) 18, wherein the inside portion of the inner portion 12c of the seal member acts as a flow field wall, and the flow field wall, said outer region (around 18b) and said separator 22 define an outermost one of said reactant gas flow fields. Steck also teaches that the separator 22 includes a surface in contact with the electrode 18 and a flat surface spaced from said electrode, said seal member includes a main seal interposed between said electrolyte and said flat surface and said flow field wall is interposed between said outer region of said the GDL and said flat surface. See also column 1, lines 15-38, column 2, line 63 – column 3, line 26 and column 4, line 56 – column 6, line 11.

At the time of the invention it would have been obvious to one having ordinary skill in the art to use metal for the electrically conductive separator plates of Sugita in order to provide a separator plate that is electrically conductive and resilient that will resist the compression of the fuel cell stack without breaking. It further would have

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been obvious to optimize the size of the gas diffusion layers such that one has a larger surface area than the other in Sugita as taught by Steck in order to reduce the amount of membrane material required as well as minimizing and/or eliminating contact between the separator plates thus reducing any corrosive attack on the separator plates and also reducing contamination of the membrane from the separator plates.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugita in view of Steck as applied to claim 1 above, and further in view of U.S. Pre-Grant Publication No. 2002/0119358 hereinafter Rock.

Sugita as modified by Steck does not teach that the shape of the flow fields are serpentine or a partition seal.

Rock teaches a bipolar plate assembly with reactant gas flow fields for fuel cells wherein a seal member includes a flow field wall between the outer region of a gas diffusion layer and a separator flat surface, said reactant gas flow field is a serpentine flow passage having at least one turn region and a partition seal is in contact with the electrolyte membrane and the reactant gas flow fields (abstract, paragraphs [0006]-[0011], [0027]-[0032], [0036], [0038]-[0040] and [0044]).

At the time of the invention it would have been obvious to a person having ordinary skill in the art to provide serpentine flow fields and a partition seal in Sugita as modified by Steck as taught by Rock in order to provide a more compact fuel cell stack that has superior sealing characteristics and utilizes fewer parts for the purpose of assembly.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT HODGE whose telephone number is (571)272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert Hodge/  
Examiner, Art Unit 1795